REMARKS

Claims 1-10, 12-17 and 19-49 are currently pending in the subject application and are presently under consideration. Claims 1, 10, 17, 19, 33, 38, 39, 40 and 47 have been amended as shown on pages 2-10 of Reply. Claims 48 and 49 has been newly added. In addition, the claims 11 and 18 have been cancelled.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments and amendments herein.

I. Rejection of Claims 1-47 Under 35 U.S.C. §101

Claims 1-47 stand rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Withdrawal of this rejection is requested in view of at least the aforementioned amendments to independent claims 1, 10, 33, 38, 39, 40 and 47 and because the claims produce a useful, concrete and tangible result. The claimed subject matter is generally directed towards selecting, controlling and optimizing utilization of machinery in an industrial automation environment. According to an aspect of the invention, the system optimizes industrial business operations. A component receives data relating to at least one state of a subset of machines that are part of the industrial business operations. A prognostics engine infers at least one future state of at least a subset of the operations based in part on the received data, the prognostics engine comprises a plurality of intelligent software agents that serve as proxies for at least the subset of machines, for modeling and representing interactions with one another, and for facilitating convergence on modification and control of the subset of machines, for efficiently optimizing industrial business operations. An optimization component selects a desired operating point as an optimum performance point within an allowable range of operation about a system set point according to performance characteristic associated with at least one of the machines and controls at least one machine according to the desired operating point. Thus, the claims generate a useful, concrete and tangible result of optimizing industrial business operations by selecting a desired operating point as an optimum performance point within an allowable range of operation about a system set point according to performance characteristic associated with at least one of the machines

and controlling at least one machine according to the desired operating point. In view of at least the foregoing, withdrawal of this rejection is respectfully requested.

II. Rejection of Claim 38 Under 35 U.S.C. §102(e)

Claim 38 stand rejected under 35 U.S.C. §102(e) as being anticipated by Bryant *et al.* (US Publication 2004/0236450 A1). This rejection should be withdrawn for at least the following reasons. Bryant *et al.* does not disclose or suggest every limitation set forth in the subject claims.

> A single prior art reference anticipates a patent claim only if it ***expressly or inherently describes each and every limitation set forth in the patent claim***. Trintec Industries, Inc. v. Top-U.S.A. Corp., 295 F.3d 1292, 63 USPQ2d 1597 (Fed. Cir. 2002); See Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The ***identical invention must be shown in as complete detail as is contained in the ... claim***. Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added).

Claim 38 recites *a data packet adapted to be transmitted between at least two computer processes, comprising a data field comprising information that regulates operation of a business component based at least upon prognostic data derived by a classifier performing a probabilistic analysis for future state of at least a subset of the operations concerning a machine and* ***a desired operating point selected within an allowable range of operation about a system set point according to performance characteristics associated with at least one of the machines***. Bryant *et al.* does not disclose or suggest these novel features.

Bryant *et al.* relates to a method of diagnosing state of a system in which a measured signal is compared to an expected signal, and the comparison is used to perform the diagnosis. The Office Action cites the Abstract and paragraphs [0114]-[0122], [0125]-[0132], [0092], [0093] and [0107] of Bryant *et al.* Contrary to assertions in Office Action, Bryant *et al.* does not disclose or suggest at these paragraphs, let alone anywhere in the document, the claimed subject matter as indicated above. Rather, these

cited sections merely disclose a method for assembling a model having correspondences with a physical system. The system is monitored so that the model parameters may be tuned to mimic the real system, whereupon the model can be manipulated to study behavior of the system. A system diagnosis is obtained by measuring "noise" in the machine, *i.e.* the difference between the actual signal as measured from the machine, and the expected signal. In the Abstract *inter alia*, Bryant *et al.* states that the model may have parameters, associated with features and/or faults of the system, that are used in diagnosing the state of the system, and that "*selectively repeated diagnosis over time may yield a prognosis of the system*." Paragraph [0122] adds that "a prognosis may predict the failure of a part." It is clear that Bryant *et al.* can only be used to model the current state of a part in a system and observe a trend, which is very different from the claimed invention. Nowhere Bryant *et al*. teaches or suggests *a desired operating point being selected within an allowable range of operation about a system set point according to performance characteristics associated with at least one of the machines*. Therefore, Bryant *et al*. fails to disclose "every aspect of the claimed invention" and for at least these reasons, the rejection of amended claim 38 should be withdrawn.

III. Rejection of Claims 1-37 and 39-47 Under 35 U.S.C. §103(a)

Claims 1-37 and 39-47 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Gotou *et al.* (US 2002/0013635 A1) in view of Bryant *et al* (US 2004/0236450 A1). This rejection should be withdrawn for at least the following reasons. Gotou *et al.* and Bryant *et al*., taken alone or in combination, do not disclose or suggest every limitation set forth in the subject claims.

> ***[T]he prior art reference (or references when combined) must teach or suggest all the claim limitations.*** *See* MPEP § 706.02(j). *See also KSR Int'l Co. v. Teleflex, Inc*., 550 U. S. ____, 04-1350, slip op. at 14 (2007). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art and not based on applicant's disclosure. *See In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added).

Applicant's claimed invention provides systems and methods for controlling a motorized system in order to achieve set point operation as well as to optimize one or more performance characteristics associated with the system while operating within specified operating constraints. Specifically, independent claim 1 recites a *system that facilitates optimizing industrial business operations,* including a *prognostics engine that infers at least one future state of the operations based in part on the received data* and includes: *a plurality of intelligent software agents that serve as proxies for at least the subset of machines, for modeling and representing interactions with one another, and for facilitating convergence on modification and control of the subset of machines, for efficiently optimizing industrial business operations*. Gotou *et al.* and Bryant *et al*., taken alone or in combination, do not disclose or suggest these novel features of applicant's claimed invention.

Gotou *et al*. relates to a system for monitoring the status of abnormality and lifetime of machine components such as a bearing having rolling elements. The system includes a plurality of determining units each connected with a plurality of sensors and a control means connected with the determining units. The Examiner concedes that Gotou *et al.* does not teach all limitations recited in the subject independent claims, and attempts to cure the deficiencies of Gotou *et al.* with Bryant *et al*. However, Bryant *et al.* merely relates to a method of diagnosing state of a system in which a measured signal is compared to an expected signal, the comparison is used to perform the diagnosis and the repeated diagnosis over the time yield a prognosis of the system; and this reference does not make up for the aforementioned deficiencies of Gotou *et al*.

At page 9 of Office Action, Examiner asserts that Gotou *et al*. teaches *selecting a desired operating point within an allowable range of operation about a system set point according to performance characteristics associated with at least one of the machines and controlling at least one machine according to the desired operating point*, with respect to dependent claim 11. Applicant's representative respectfully disagrees. At the indicated portions, Gotou *et al.* provides for a determining unit for determining whether or not a defect signal component contained in a sensor waveform deviates from a predefined range. If the defect signal has been determined as deviating from the predefined range, the sensor waveform contains an abnormality. Comparison between

the defect signal component and the predefined range can be affected to any of the amplitude, the signal width and the phase appearing in the defect signal (*See*, Page 2, Paragraph [0020]). Hence Gotou *et al*. provides for only detecting presence or absence of abnormality in a machine component. More particularly, Gotou *et al*. provides for determining if a defect signal component deviates from a predefined range and the sensor waveform or machine component contains an abnormality. However Gotou *et al*. does not contemplate *selecting a desired operating point within an allowable range of operation about a system set point according to performance characteristics associated with at least one of the machines and controlling at least one machine according to the desired operating point*. Through this feature, the claimed subject matter facilitates correlating efficiency information related to the components of the system, along with such efficiency information related to components of a larger process or system of which the system is a part, in order to select the desired operating point for optimization of overall system efficiency. For example, the pump may be operated within the allowable range about the set point in order to achieve global optimization of one or more performance characteristics of a larger process or system of which the pump system is a part. Thus the components (*e.g.*, pump, motor, drive) of the system may be operated at less than optimal efficiency in order to allow or facilitate operation of such a larger process at optimal efficiency.

At page 9 of the of the Office Action, the Examiner again erroneously asserts that Gotou *et al*. substantially teaches *correlating at least two of motor efficiency information, pump efficiency information, and motor drive efficiency information in order to derive correlated system efficiency information and selecting the desired operating point as the optimum efficiency point within the allowable range of operation according to the correlated system efficiency information*, with respect to dependent claim 14. The cited portion of the reference, Gotou *et al*., provides for a machine component of a type provided with rolling elements such as those used in a rolling bearing, a constant speed joint, and a ball screw mechanism. A machine comprises a plurality of the machine components, and may be installed on production or servicing line of a manufacturing plant (Page 18, Paragraph [0208]). The other section of reference (Gotou *et al.*) provides for a determining unit for determining whether or not a defect signal component

contained in a sensor waveform deviates from a predefined range. If the defect signal has been determined as deviating from the predefined range, the sensor waveform contains an abnormality (Page 2, Paragraph [0020]). Hence Gotou *et al*. provides for only a machine comprising a plurality of the machine components which are of a type provided with rolling elements and determining if a machine component contains an abnormality and fails to teach or suggest *correlating at least two of motor efficiency information, pump efficiency information, and motor drive efficiency information in order to derive correlated system efficiency information and selecting the desired operating point as the optimum efficiency point within the allowable range of operation according to the correlated system efficiency information.* Through this feature, the claimed subject matter facilitates determining a desired operating point within the allowable operating range at which the efficiency of the system or a larger process is optimal. The correlation of one or more of the pump efficiency information related to the pump, motor efficiency information related to the motor, and motor drive efficiency information related to the motor drive is computed and employed to provide near-optimal operation to enhance robustness (*e.g.*, to reduce sensitivity), in order to provide better overall optimization.

Therefore, Gotou *et al*. and Bryant *et al*., taken alone or in combination, fail to disclose or suggest every aspect of the claimed invention. For at least these reasons, the rejection of independent claims 1, 10, 33, 38, 39, 40, 44 and 47 (and claims that depend there from) should be withdrawn.

IV. New Claims 48 and 49

Newly added claims 48 and 49 emphasize novel aspects of the invention discussed *supra* in connection with claims 1, 10, 33, 38, 39, 40, 44 and 47. Support for these claims can be found in the specification as filed at pages 56-57 and 60-61. Accordingly, these claims are patentably distinct over the art of record for at least the same reasons as are claims 1, 10, 33, 38, 39, 40, 44 and 47.

CONCLUSION

The present application is believed to be in condition for allowance in view of the above comments and amendments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [ALBRP246USC].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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